



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/592,936   | 09/15/2006  | Koji Katano          | 129370              | 6051             |
| 25944 7590 07/21/2011<br>OLIFF & BERRIDGE, PLC<br>P.O. BOX 320850<br>ALEXANDRIA, VA 22320-4850 |             |                      |                     |                  |
| EXAMINER   |             |                      |                     |                  |
| LEE, CYNTHIA K   |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 1726   |             |                      |                     |                  |
| NOTIFICATION DATE  |             | DELIVERY MODE        |                     |                  |
| 07/21/2011   |             | ELECTRONIC           |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com  
jarnstrong@oliff.com

# Office Action Summary

## Application No.

10/592,936

## Applicant(s)

KATANO, KOJI

## Examiner

CYNTHIA LEE

## Art Unit

1726

**Period for Reply**  
-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/25/2011 has been entered.

***Response to Amendment***

This Office Action is responsive to the amendment filed on 2/25/2011. Claims 1, 2, 4, 5, 7, 9-11 are pending. Applicant's arguments have been fully considered. Claims 1, 2, 4, 5, 7-11 are non-finally rejected for reasons stated herein below.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear if "a plurality of hydrogen exhaust valve" of claim 11 includes "a hydrogen exhaust valve" of claim 1 or not.

It is unclear if "a plurality of spring members" of claim 11 includes "a spring member" of claim 1 or not.

It is unclear as to which one of the plurality of the valves in claim 11 is referred to in "a spring member interposed between the hydrogen exhaust valve and one of the first portion and the second portion to urge the hydrogen exhaust valve against the other one of the first portion and the second portion" in claim 1.

It is unclear as to which one of the plurality of the spring members in claim 11 is referred to in "a spring member interposed between the hydrogen exhaust valve and one of the first portion and the second portion to urge the hydrogen exhaust valve against the other one of the first portion and the second portion" in claim 1.

It has been interpreted that one additional valve and spring from claim 1 meets the limitation of claim 11.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 5, 7, 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greiner (US 5728183) in view of Farooque (US 2084362) and Kiku (US 6908069).

Greiner discloses a first portion 60 and a second portion 25 which cooperate with each other to jointly form a passage for hydrogen exhausted from the fuel cell body, a hydrogen exhaust valve 43 disposed in the passage between the first portion and the second portion, wherein the first portion 60 and the second portion 25 are directly fixed to each other.

Regarding claim 2, the first portion includes a gas-liquid separation unit 60 supplied with heat from inflowing exhaust gas from the fuel cell body.

Regarding claim 4, the second portion is a hydrogen processing unit 25 supplied with heat from inflowing exhaust gas from the fuel cell body.

Regarding claim 5, the hydrogen processing unit 25 includes a combustion unit.

Regarding claim 7, the first portion includes a cover 41 formed with an internal space that accommodates the hydrogen exhaust valve; and the second portion 21 closes the internal space of the cover within which the hydrogen exhaust valve is disposed. See fig. 1.

Regarding claim 9, the hydrogen exhaust valve 43 is fixed to the first portion 60 and the second portion 25. See fig. 1.

Regarding claim 1, Greiner discloses a shift reactor 19, but does not disclose a fuel cell body, wherein the first and second portion jointly form a passage for hydrogen exhausted from the fuel cell body. Farooque teaches a fuel cell, wherein the anode

exhaust stream in the line 4 is first fed through a shift converter 7A which increases the hydrogen content in the stream by converting any CO in the stream to hydrogen (2:55-60). It would have been obvious to one of ordinary skill of art at the time the invention was made to use the system of Greiner at the anode exhaust of a fuel cell, as taught by Farooque, for the benefit of converting any CO in the stream to hydrogen.

It is noted that both portions naturally are supplied with heat continuously from the fuel cell body following start up of the fuel cell body because the temperature of the fuel cell is elevated during operation and thus, the hydrogen exhaust possesses heat.

Regarding claim 1, Greiner modified by Farooque does not teach a spring member is interposed between the hydrogen exhaust valve and one of the first portion and the second portion to urge the hydrogen exhaust valve against the other one of the first portion and the second portion. Regarding claim 10, Greiner modified by Farooque does not teach seal mechanisms are respectively interposed between the hydrogen exhaust valve and each of the first portion and the second portion. Kiku teaches the following: Regarding claim 8, Kiku teaches a spring member 69 is interposed between the hydrogen exhaust valve and the first portion 1 to urge the hydrogen exhaust valve against the second portion 92. Regarding claim 10, Kiku teaches seal mechanisms 92p and 17 are respectively interposed between the hydrogen exhaust valve and each of the first portion and the second portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the valve of Kiku as the hydrogen exhaust valve of Greiner modified by Farooque for the benefit of moving the hydrogen exhaust.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greiner (US 5728183) in view of Farooque (US 2084362) and Kiku (US 6908069) as applied to claim 1, further in view of Bailey (US 5374029).

Greiner modified by Farooque, Kiku teaches all the elements of claim 1 and are incorporated herein.

Greiner modified by Farooque, Kiku does not teach a plurality of hydrogen exhaust valves and a plurality of spring members interposed between the plurality of hydrogen exhaust valves. Bailey teaches wherein a plurality of flow control valves are disposed in series to enhance performance, reliability, and safety (11:41-43). It would have been obvious to one of ordinary skill of art at the time the invention was made to use a plurality of Kiku's valves in the reactor of Greiner, as taught by Bailey, for the benefit of enhancing performance, reliability, and safety compared to a single valve.

### ***Response to Arguments***

Applicant's arguments filed 2/25/2011 have been fully considered but they are not persuasive.

*Applicant asserts that the valve of Kiku is merely intended to change flow paths and does not allow for the opening and closing of the valve in response to fluctuations in pressure as in Greiner.*

In response, it is noted that Kiku's fluid valve functions to control the quantity of fluid flowing through the fluid valve [0008]. The valve is designed so that fluid flows from the fluid intake to the fluid outlet [0009-0010]. Thus, the combination is proper.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CYNTHIA LEE whose telephone number is (571)272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-12922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/  
Primary Examiner, Art Unit 1726